

REMARKS

The Office Action mailed July 3, 2002, has been received and reviewed. Claims 7, 8, 15, 16, 25 through 31, 38 through 44, 46 through 51, and 57 through 61 are currently pending in the application. Claims 15, 16, 26 through 29, 38 through 44, 46 through 51, and 57 through 62 stand rejected. Claims 7, 8, 25, 30, and 31 have been allowed. Applicants have amended claims 26 through 28, 38 through 40, 46, 48 through 50 and 59 through 61, and cancelled claims 29 and 51 without prejudice or disclaimer. Reconsideration of the application as amended herein is respectfully requested.

35 U.S.C. § 112 Claim Rejections

Claims 15, 16, 26 through 29, 38 through 44, 48 through 51, and 57 through 61 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants respectfully traverse this rejection, as hereinafter set forth.

In rejecting claims 15, 29, 51 and 57, the Office asserts the specification fails to sufficiently describe conductive material comprising a height to width ratio of at least approximately 3 to 1 concurrent with a generally planar second surface. Applicants respectfully submit the original disclosure conveys with clarity that, as of the filing date sought, Applicants were in possession of the claimed invention. See M.P.E.P. § 2163.02.

Concerning the claim 15 and 57 limitations of at least one conductive bump having a height to width ratio of at least approximately 3 to 1 concurrent with a generally planar surface, the original disclosure describes the present invention with an example of forming adhesive prints 102 on a semiconductor substrate 104 (specification, pages 12-13 and Figs. 1-5). Referring to Fig. 3, the description of the example expressly provides "... the adhesive prints 102 are ideally formed with vertical side walls 122 and a planar upper surface 124." (specification, page 12, lines 20-22). The assembly is then inverted to contain the flow and expansion of

adhesive prints 102 during drying or curing, providing increased wall angles and top surface area (specification, page 13, lines 7-13). The original disclosure goes on to describe adhesive embodiments 202, 302, 402, 502 for other semiconductor device structures, which are formed using the present invention to similarly contain flow and expansion (specification, pages 15-16 and Figs. 15-22). Specifically, the example for forming conductive bumps 502 describes maintaining the definition of bumps 1002 formed with a print screen or stencil by inverting them, as with adhesive prints 102 (specification, pages 9 and 16 and Figs. 22 and 41-43). Maintaining the definition allows formation of conductive bumps 502, achieving "height to width ratios of the preferred target of 3:1 or greater" (specification, page 16, lines 23-27). Therefore, Applicants respectfully submit the original disclosure contains sufficient description to support the limitations in claims 15 and 57 of "at least one laterally unconstrained conductive bump comprised of a viscous adhesive material ... exhibiting a height-to-width ratio of at least approximately 3 to 1 and including ... a second exposed surface ... exhibiting a generally planar portion over a substantial portion thereof."

The rejection of claims 29 and 51 is moot, as they have been cancelled without prejudice or disclaimer.

Concerning the range limitations of claims 26 through 28, 38 through 40, 48 through 50 and 59 through 61, Applicants have amended these claims as suggested by the Examiner and submit that in their amended form they comply with the provisions of 35 U.S.C. § 112, first paragraph.

35 U.S.C. § 102(a) Anticipation Rejections

Anticipation Rejection Based on Applicant's Admitted Prior Art

Claims 46 through 51 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Applicants' Admitted Prior Art. Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

The portions of the specification which the Office has cited as being Applicants' Admitted Prior Art are directed in part to U.S. Patent 5,286,679 to Farnworth et al. Farnworth et al., incorporated into the disclosure of the present invention and assigned to the same assignee, discloses a method for attaching a die to a lead frame using a patterned adhesive layer. In one embodiment, Farnworth et al. teaches applying an adhesive layer to a semiconductor wafer, wherein the adhesive layer is patterned into adhesive prints with a stencil or screen print template to keep streets and wire bond pads clear of adhesive (specification, pages 2-4 and 12). Ideally, when the stencil or screen print template is removed, the adhesive prints are formed with vertical side walls and a planar upper surface (specification, page 4, lines 19-21 and page 12, lines 20-22). However, since the adhesive must have sufficiently low viscosity to flow and fill the stencil or screen print template and to avoid sticking thereto during removal, *the viscous adhesive will spread, sag or flow laterally under the force of gravity* (specification, page 3, lines 22-27 and page 12, lines 22-29 and Fig. 4).

Applicants respectfully submit that neither Farnworth et al. or Applicants' discussion thereof show, either expressly or inherently, each and every element of claim 46 in its presently amended form. Claim 46, as amended, recites in part the limitation of "a semiconductor substrate including at least one laterally unconstrained adhesive patch comprised of a viscous adhesive material *exhibiting a stable, self-supporting shape*" (Emphasis added.). As discussed at pages 2 through 4 and 12 of the present specification, the method of Farnworth et al. exhibits problems with adhesive containment. Rather than describing the above limitation of claim 46, viscous adhesive applied to a substrate according to the method of Farnsworth et al. can suffer from undesirable spreading, sagging or flowing due to gravitational force during drying or curing

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of the adhesive. This raises the possibility that the viscous adhesive print or patch will run onto adjacent surfaces, interfering with bonding locations and presenting uneven attachment surfaces. Accordingly, the structural characteristics described by Applicants in terms of Farnsworth et al. do not possess the feature of the amended claim 46 limitation of an adhesive material "*exhibiting a stable, self-supporting shape.*"

Therefore, Applicants respectfully submit Applicants' Admitted Prior Art does not anticipate claim 46, and that it is allowable under the provisions of 35 U.S.C. § 102(a).

Moreover, claims 47 through 50 are allowable, among other reasons, as depending from independent claim 46.

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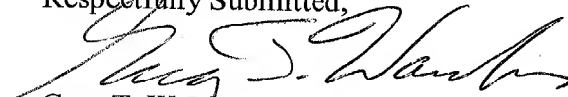
ENTRY OF AMENDMENTS

The amendments to claims 26 through 28, 38 through 40, 46, 48 through 50 and 59 through 61 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application.

CONCLUSION

Claims 7, 8, 15, 16, 25 through 28, 30, 31, 38 through 44, 46 through 50, and 57 through 61 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully Submitted,



Greg T. Warder
Registration Number 50,208
Attorney for Applicants
TRASKBRITT, PC
P.O. Box 2550
Salt Lake City, Utah 84110
Telephone: (801) 532-1922

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Enclosure: Version of Claims with Markings to Show Changes Made

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